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AN INQUIRY
INTO THE
THERAPEUTIC VALUE OF MERCURY
AND
ITS PREPARATIONS.

A PRIZE ESSAY

AWARDED BY THE CONN. MEDICAL SOCIETY, MAY 24, 1866.

Amicus Plato, amicus Socrates, sed magis amica Veritas.

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AN INQUIRY

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SCIENCE is essentially progressive. Year by year, from out the boundless ocean of Truth, she is gathering new treasures of fact and thought. In the department of medical science, this progress, for some years past, has been especially rapid. More exact and thorough research, with the aid of the microscope and the chemist's laboratory, has brought to light one discovery after another, in Physiology and Pathology, in Materia Medica and Clinical Medicine, till the general practitioner, amid the over burdening routine of daily duties, almost despairs of keeping pace with a science of which he once thought himself a master.

Nor is it alone that new facts are discovered, and new principles evolved. Cherished dogmas of the past, receiving a full assent in the dimmer light of an earlier day, are now brought to the test of a more enlightened criticism, to stand or fall as the truth is in them. In this ceaseless search for truth, especially in the rigid sifting of the chaff from the wheat, do we find the strongest assurance of the stability and final triumph of legitimate medicine.

The topic proposed for this essay is one upon which professional opinion has been much unsettled of late. It may be aptly introduced in the language of a standard authority in medical matters, (Dr. Bennett of Edinburgh,) who says:—

“In the present state of science and art of medicine, there is no point in therapeutics which so utterly requires re-investigation, as the real value of the therapeutic effects attributed to mercury.”

In this essay, the writer does not pretend to any new or original investigations into the practical operations of this powerful agent. It will be his endeavor carefully to inquire into the properties of the article in question, to consider what evils attend its use, and

then, with impartial judgment seek for such conclusions respecting its real therapeutic value, as our present knowledge will warrant.

The use of mercury as a medicine was derived from the East, and became general in Europe about the time of the alarming spread of Syphilis, in the 15th Century. At first it was restricted mainly to the treatment of that disease, and was employed only in the form of external application, by inunction or fumigation. A century afterward it came into use as an internal remedy, but it was not till near the close of the last century, that the belief in its antiphlogistic properties became general; a belief which, however, has never prevailed on the Continent of Europe to the same extent as in Great Britain and this country. Since that time, mercury has been prescribed in almost every disease, and in pathological conditions the most diverse, until the prevalent impression of the power of this remedy had, at one time, become so exalted, and yet so indefinite, as almost to justify the sarcastic aphorism,—“When you don't know what to give, give Calomel.” More recently, there has been a disposition among the leading minds of the profession to question the claims of this mineral; and certainly, its use has very much declined of late.

In the endeavor to ascertain the generally received idea of the *modus operandi* of this medicine, one is struck no less by the multiplicity of diseased states to which authors believe it appropriate, than by the vagueness of the hypotheses, by which they would explain its action. Many of these theories are evidently due to the crudity of physiological knowledge at the time they were presented. Some have thought that mercury acts mechanically by its weight, divisibility and mobility; others have attributed its peculiar properties to some imaginary chemical action; others again, looking to the kind of action it produces in the system, consider it a stimulant, a sedative, a tonic, an alterative, or as possessing a combination of these qualities. The U. S. Dispensatory informs us, “Of the *modus operandi* of mercury we know nothing, except that it probably acts through the medium of the circulation, and that it possesses a peculiar alterative power over the vital functions. This alterative power, at times, is attended with certain obvious effects, indicative of the agency of a potent stimulus.” In this uncertainty of medical authorities, we are thrown back upon the right of private judgment, and are left to form an opinion of this, as we should of any remedy, from study of its peculiar physiological action upon the organism in health, and its observed operation in disease, deducing thence such theory of its action as seems best to accord with the facts on record.

Inquiring, then, into the *physiological action of mercury*, we perceive, at the outset, that it is in some way directly antagonistic to animal life, and this, whether in its corrosive compounds or in its metallic state. The smaller living organisms, as insects, are rapidly destroyed by it. We are all familiar with the effect of the Ungt. Hydrargyri upon pediculi pubis, and other parasites. Experiments prove that the eggs of flies, and other insects, fail to be developed under circumstances otherwise favorable, if placed over mercury. Hens' eggs, thus situated, failed to hatch, while the chick already formed in some of them, perished. Upon the larger animals and man, its effects are alike in kind, though of course not equal in degree. In Idria, Austria, in the district infected by the mercurial fumes thrown off by the roasting of the ores, the annual mortality is more than 1 in 40; while premature births and abortions are very common among human beings, and even animals. The same marked tendency to abortion, and to feebleness of themselves and offspring, is witnessed among male and female operatives exposed to mercurial vapors; while the mortality among such, especially among the Austrian miners, notwithstanding every precaution to prevent it, is so great, that higher wages are given to counterbalance the risk to health and life.

The effect of mercury is very decided upon the nervous system. The feeling of prostration so often produced even by an ordinary purgative dose, is well known. This nervous depression, by continued exposure, especially to mercurial emanations, as in case of miners, mirror and barometer makers, and the like, may go on to shaking palsy, the so-called mercurial tremblings, or even to epilepsy and apoplexy. Mental imbecility, it is asserted, has resulted from such continued influence of the metal upon the brain and nervous system.

If mercury be taken in medicinal doses, we find that the activity of the secretions is increased; if its use is still further continued, so as to fully develop its effects, Dr. Stillé informs us, that "the appetite fails, digestion is impaired, the secretions become still thinner and more copious; the firmness of the tissues diminishes, newly formed callus is dissolved, and recently healed wounds open afresh; the muscles waste, the skin has an earthy paleness; the eyelids and ankles become œdematous, and even general dropsy may ensue."

In the rapidly developed paleness of the skin, we have ocular evidence that the corpuscles of the blood are either largely destroyed, or their necessary repair is prevented, probably both. Dr. Farre tells us, as quoted by Pereira, "a full plethoric woman, of a purple red complexion, consulted me for hemorrhage of the stomach, depending

on engorgement without organic lesion. I gave her mercury, and in six weeks blanched her white as a lily" (!) The experiments of Dr. Samuel Wright, quoted by Christison, have determined that the blood of those under the influence of mercury becomes more watery than in health; is loaded with a fetid fatty matter, [the result, evidently, of degenerative processes,] and is more prone than usual to decomposition.

Now then, observe these prominent points;—that under the influence of mercury, the eggs or the fœtal young of animals fail of development, and become abortive; that in the perfectly developed animal, new, and therefore feeble, formations, as the recent callus of bone, or the cicatrices of wounds, are dissolved; that the corpuscles of the blood rapidly disappear, and an excess of fat is formed in the circulating fluid; that general emaciation ere long takes place;—do not these facts convince us, that we have here an agent, whose physiological action upon living animal tissue is to destroy its nutrition, in other words, its vitality? We perceive that the ordinary breaking down and decay of the tissue is accelerated by it, while its natural repair is at the same time impeded. Such organic cells as are engaged in secretion, are, in general, stimulated into greater activity, to eliminate the poison from the system; hence the observed increase of secretion caused by mercury. The other cells, less able thus to throw out the poisonous substance from their interior, more markedly display the deadly tendency of the drug in their disintegration, and sooner or later a similar effect will likely be felt in the cells of secretion also. Hence result in the nutritive, the muscular, the nervous, the secreting systems, more or less depression of the vital functions, emaciation, general cachexia, and, at last, if the operation of the agent be sufficiently powerful and continuous, death of the entire organism. We believe, then, that the main effect of mercury is to destroy cell life, and that its so-called stimulant effect is simply the effort of the system to expel a dangerous intruder, which possesses the dreaded power of insinuating itself everywhere. Whether it may not be judicious for us at times to employ a destructive agent of such energy, is a question yet to be considered.

The completeness with which mercury penetrates every part, and the prolonged duration of its stay, when once the system is impregnated with it, is truly astonishing, and serves to exalt our ideas of the power for good or ill of this agent. In animals or in man, after external inunction merely, it has been detected in the blood, in the glandular secretions, the urine, bile, milk and saliva, and in the glands

themselves. It has been discovered, in the metallic state, in the bones, "in the brain, the synovial capsules, the pleura, the humors of the eye, in connective tissue, in the lungs," &c. It has been found in the serum of blisters, and in the fluid of ulcers. Two cases are reported of pregnant women aborting during mercurial inunction, where mercury was detected in the bodies of the children.

How long the drug may remain in the system, when once fairly lodged there, we know not. Long after a continued administration of mercury, its constitutional effects may be re-excited by Iodide of Potassium; the chemical reaction of that agent bringing out into activity the mineral hitherto locked up in the tissues. Dr. Stillé cites, with authorities, the case of a lady, a year after salivation, on being heated by violent dancing, dark mercurial stains appeared on her breast, and metallic mercury was obtained from her linen. Also, a workman, who for six months had not handled mercury, and yet whitened a piece of copper by rubbing it between his fingers. Such are, of course, extreme cases of mercurial saturation, yet they teach us that we know not the end of the train of effects, which may be set in motion by this powerful medicine.

But any account of the properties of mercury will be incomplete, without a reference to what Van Swieten, a hundred years ago, aptly denominated "the tortures of Salivation." Fortunately, for the credit of the profession, so much milder counsels prevail at the present day, that few of the junior practitioners know by experience how much may be accomplished in this way. Nor is it very desirable thus to know. The sight of a patient with his swollen face, the saliva dripping from his mouth, the tongue protruded and swollen, and the whole interior of the mouth red and tender, the gums spongy, the teeth loosened, the breath horribly offensive, the inflamed salivary glands so painful that he cannot move his jaws, and can plead only with those despairing eyes;—it presents a picture of suffering not very conducive to the peace of mind of the physician, nor suggestive of any very extensive professional success in the future. Following the salivation, may be ulceration, and sloughing of the cheeks and fauces, producing, if the patient recover, disfigurement for life, or permanent adhesions, even to preventing all motion of the jaws. Such ulcerations may occur without a previous salivation, and may also affect other parts than those about the head.

But the question of the physiological action of mercury upon the *Liver*, demands more than a passing notice. The U. S. Dispensatory, but echoing a prevalent impression, states:—"there is no fact better

established in medicine, than that of the influence of the mercurial preparations over the hepatic system, and whether the liver be torpid or obstructed as in jaundice, or pouring out a redundancy of morbid bile, as in *melæna*, its judicious use seems equally efficacious in unloading the viscus and restoring the secretion to a healthy state." Under the influence of mercurials in small doses, it tells us, "the alvine discharges, if clay colored, are generally restored to their natural hue; a certain proof that the remedy is stimulating the liver, and promoting the secretion of the bile."

It is quite time that the profession were disabused of this unfortunate idea, that the change of color in the stools referred to, is an infallible proof of the presence of bile. This change of color of the healthy intestinal contents, from whitish to yellow or brown, does not take place until the fecal matter reaches the large intestine. Even on the theory then, that it is the bile which causes this change, we must acknowledge the operation of some new agency in addition, since the bile has been present all along, from the duodenum down. The only new element to be found here is the glandular secretion of the part. Suppose then we grant that bile is the normal stimulant of these glands; it is after all the secretion of these glands, and not the bile, which is the real agent of the change in question. Is it not possible then, that some other stimulus may induce the secretion of these glands, and effect this change of color, even when no bile is there? Not only possible, but certain. Witness a case, coming under Dr. Bennett's observation, recorded in his *Clinical Lectures*, (2nd Am. Ed., page 456). This patient presented symptoms of intense jaundice, the skin a deep yellow, the urine continually loaded with bile. The autopsy revealed a gall stone, size of a hazel nut, firmly impacted in the common bile duct, half an inch above the duodenum; the liver was an olive green throughout, gall ducts immensely dilated, thickened and filled with dark green bile. "Death resulted from the poisoning of the system through the absorption of bile, the excretion of which was prevented by the firm impaction of a calculus in the common bile duct." Yet in the daily record of the case his stools were reported according to the prevalent idea, "well colored with bile," when of course there could have been no appreciable amount of bile in them. Mercury was administered for eight days, by inunction and by the mouth, and dark green stools testified to its presumed hepatic stimulation. Here we have the theoretical proof of the presence of bile, and of mercurial action on the liver on the one hand, and on the other the stubborn physical proof that no bile could get there,

except infinitesimally through the circulation. Theory and fact at variance—which shall yield?

The observations of Dr. Thudichum, in the London Lancet for Oct. 1860, explain the difficulty. He says—"The stools which are passed after the use of purging mercurials, particularly calomel, are supposed to contain more bile than usual. The assumption rests upon the observation that these stools are mostly green—a fact which appears to me to be at the bottom of the whole tissue of errors. The green color of the calomel stools is due to subsulphide of mercury, just as the black color of the stools following the use of the preparations of iron is due to the subsulphide of iron. The subsulphide of mercury can easily be obtained from these stools by levigation or chemical proceeding—so much is proved." It is reasonable to ascribe the scalding of the anus, after calomel or blue pill, to this subsulphide. The change of color, then, of the stools from clay color to brown is proof merely that *some* stimulus, it may, or it may not be, bile, is acting upon the glands of the large intestine. The green color after mercurial purgatives, is merely a proof of the presence of the subsulphide of that matter.

Now it is a little remarkable that this universal belief in the hepatic powers of mercury rests alone upon the theory, (refuted as it is by even one case like that of Dr. Bennett's,) that dark or green stools prove the presence of bile. Besides this theory, there is absolutely no other proof presented to us. In fact, it looks as if all the proof were the other way. For, among the multitudes who have experienced the excessive action of mercury, even to fatal poisoning, no excessive or marked hepatic symptoms are recorded—rather the reverse. In one case, where leathern bags containing some tons of mercury burst in the hold of a ship of war, by the mercurial emanations 200 men were salivated, and two died; yet, amid this mass of cases, nothing displaying hepatic action of the metal was observed worthy of record. And so in other cases of fatal poisoning. Is there anything analogous in the history of other specifics. Can we indeed call that a specific whose claim originating in an error of observation, is never corroborated, even when we might the most expect it should be?

But direct experiments have been instituted to test the question of the hepatic influence of mercurials. Three observers, Kölliker, H. Nässe and H. Müller found that "the addition of calomel to food which under ordinary circumstances produced a certain and normal quantity of bile in dogs, diminished the quantity of bile," (Braithwaite's Retrospect, July, '61). The careful experiments of Dr. Geo.

Scott, reported in Beale's Archives of Medicines, are especially decisive. The common bile duct in a dog was exposed, ligated and divided, and an external fistula, leading into the gall bladder, established. The wound healed kindly. That the entire bile secreted was emptied through the fistula, and none absorbed into the blood, was proved by repeated examinations of the urine in the course of the experiments; and the subsequent autopsy demonstrated that no communication had been re-established with the duodenum. The average quantity of bile secreted in the 24 hours, for two days previous and two days after the administration of mercury, was carefully estimated, and every precaution taken to ensure a similar use, or abstinence from, the same articles of diet during the continuance of each separate experiment. The following results in brief were obtained:

Date.	Calomel administered.	Daily average for 2 days previous:			Daily average for 2 days after:		
		Fluid bile,	bile solids,	bile acids,	Fluid bile,	bile solids,	bile acids,
June 13,	3 grains	3044 gra.	139 gra.	61 gra.	1358 gra.	70 gra.	26 gra.
" 16,	6 "	1960 "	104 "	32 "	518 "	42 "	10 "
July 3,	10 "	1639 "	77 "	12 "	2720 "	135 "	70 "
" 7,	12 "	2658 "	117 "	57 "	1724 "	850 "	45 "

After each administration of the calomel, we notice a decrease of fluid bile; after the first dose, of 602 grs., the second, 1121 grs., the third, 324 grs., after the fourth dose, 934 grs. (In these experiments Dr. Scott established the interesting fact that calomel purges irrespective of the presence of bile.) To the objection that, even if calomel does not act upon the liver in dogs, it is no proof it may not in man, Dr. Scott replies,—that allowing this, then all our experiments on the lower animals to ascertain the characters of poisons are valueless. Should it be suggested that perhaps calomel acts differently in health from which it does in disease, the Dr. replies, there is no analogous instance of any remedy, diuretic or diaphoretic for instance, which checks in health that secretion which it stimulates in disease. He adds, "whether it be the mere purgative effect of calomel, or some specific action which causes the diminution in the secretion of bile, further experiment must decide."

But if calomel does not stimulate the liver, what action, then, can we assign it in bilious colic and various abdominal disorders, where it is thought experience has demonstrated its power, if anything can be called demonstrated? This brings us to a further physiological inquiry of much importance, which we may now properly consider, viz: *upon what portion of the intestinal canal does mercury exert its peculiar influence?* The clue to the answer is given us by the post-mortem appearances in fatal cases of mercurial poisoning. Although

the mercurial action be excessive in such cases, we find we can readily separate the corrosive action of the compound from that of the metal itself.

In Taylor on Poisons—(Am. Edition of '48, page 322), is related a case of poisoning by two drams of corrosive sublimate; death occurring in four days. Leaving out of view the œsophagus and stomach, as evincing rather the direct inflammatory action of the irritant swallowed, we find,—“the duodenum and jejunum were healthy; there was slight inflammation of the mucous membrane about the lower two thirds of the ileum, and this was more marked towards the termination of the intestine. Near to the cæcum there were several patches of inflammation. The whole of the large intestines were highly inflamed, and there were several small spots of ulceration about the size of a pea. The liver was enlarged and congested; the gall bladder contracted, and containing scarcely any trace of bile.”

Stop here a moment, and let us analyze this case. If the theory were correct, that the hepatic action of mercury were but its irritation of the duodenum propagated along the gall ducts to the liver, we should expect to see decided proofs of such irritation; but the report is “duodenum and jejunum healthy.” It should be remarked that in this case early and copious vomiting, and the free use of albumen, no doubt prevented any appreciable amount of the poison passing the pylorus. The liver is found congested,—no free secretion in any congested organ, and so, in the gall bladder scarce a trace of bile. The stress of the inflammatory action, as reported, evidently falls upon the lower end of the small intestine, and the “highly inflamed large intestine.” How did the poison get there? Certainly it could not have been carried there by peristaltic action along that healthy jejunum. It must have been absorbed into the blood, and *eliminated at this point*. So thoroughly was the poison eliminated in this case, that no trace of mercury was detected by a chemical analysis of the contents of the stomach, of the blood, the spleen, and the serous liquids in the pericardium and peritoneum. From this case, then, we judge that the abdominal influence of mercury is specifically expended upon the colon and the small intestine immediately adjacent; and in an especial manner, of course, upon the glandular structure of this part.

But do other reported post-mortem examinations corroborate this opinion? Let us see. In the same work on Poisons, page 335, we find another death from corrosive sublimate, occurring at about the same interval. “Duodenum tolerably healthy, small intestines healthy, lined with thick, yellow mucus. Cæcum and ileo-cæcal valve

showed signs of most intense inflammation. Colon and rectum, especially the ascending and the transverse colon, also exhibited traces of the most violent inflammation. Here were found oval patches of sloughing mucous membrane, tinged green by the faeces." Page 320, still another case; a scruple taken: "Death occurred on ninth day; the mucous membrane of the stomach was softened, but there were no well marked appearances of the action of the poison in this organ. The cæcum had been the seat of the most violent inflammation, the whole surface being of a deep, black red, color, and there were patches of sloughing in the coats." Page 319,—poisoning by external use of an ounce of corrosive sublimate, fatal on the 5th day. "On inspection, the small intestines were greatly inflamed throughout, and the lower portion of the colon and the rectum in a state of mortification." Page 337.—"Mr. Swan found that calomel given to a good sized dog, in doses of from 3 to 4 grs., night and morning, gave rise to * * * death on the 9th day. The stomach and all the thoracic and abdominal viscera were sound, with the exception of some appearance of chronic inflammation in the large intestines. A similar experiment on another dog gave like results." Page 344—poisoning by Turpeth mineral, (subsulphate of mercury.)—"the small intestines were contracted, the inner coat reddened, and petechial spots were found, but chiefly in the large intestines." Here are all the cases of mercurial poisoning recorded in Taylor's work, with any references to the intestinal appearances; and of course reported with no reference to the question before us. Can any candid reader, with this testimony and such as has been heretofore adduced, escape the conviction that the *specific action of mercury is exerted*, not upon the upper, but *upon the lower portion of the bowels, and especially the colon?*

After demonstrating the fact that the color of the faeces is changed soon after they enter the colon, Dr. Leman, (in Brathwaite for July, '61,) makes the interrogative suggestion—"May not a *clayey diarrhoea*, then, simply demonstrate that the *colon*, and not the liver is sluggish?" Following out the suggestion we naturally now inquire—May not the action of mercury, in relieving bilious colic and the like, be but the normal manifestation of its power in stimulating to action the sluggish glands of the colon and adjacent parts?—Our investigations certainly point to such a conclusion; and this belief of the operation of mercury in intestinal disorders, we do not hesitate to adopt.

To sum up, now, this survey of the physiological action of mercury, we believe, first, that mercury is essentially destructive to the cell

life of animal organisms, and this, whether the metal acts alone, or in combination. In this power thus to modify, to destroy the nutrition of the body, mercury is undoubtedly an alterative. We believe that it possesses such extreme divisibility and facility of absorption, that there is scarce any portion of the body which it cannot reach; and that having once effected a lodgment, it may remain there for an indefinite period. We believe that, in the effort to eliminate it from the system, most of the secretions are called into increased activity, especially those from the extremes of the alimentary canal, the salivary glands, and, more invariably those of the colon. We believe that there is no *proof* whatever of its stimulating the secretion of the liver; its effect on the other hand, in cathartic doses, at least, is to diminish that secretion.

Having thus disposed of these preliminary points, we may now come to the main question,—What is the real therapeutic value of mercury and its preparations?

But before proceeding further let us clearly understand the two methods in which mercury may be administered, and the radical difference of its operation according to the method selected. If given as a purgative, in one large dose, the metal is rapidly excreted. Certain experiments of Orfila's would show, that the excretory efforts of the system are more urgent and effectual in the case of mercury than of any other metallic poison. So then, if mercury be administered in one, or in not more than two consecutive doses, we may believe that, in general, it will be entirely carried out of the system. If, however, the same, or a very inferior amount of mercury, be administered in minute, repeated doses, it is mainly absorbed and remains in the system for a sufficient time at least, to produce the constitutional effects of the drug. We except, however, the case of such doses administered to very young children, in whom the very great activity of their excreting organs secures its speedy elimination from the system.

Against the former method of administration—in large doses, but seldom repeated, whose direct action is mainly a local one 'upon the large intestine,' no objection of any moment lies; except so far as the risk of somewhat of the dose failing of speedy excretion, or the chance of encountering one of those peculiar idiosyncrasies, or possibly, an exalted susceptibility to the action of even a single dose, induced by some previous mercurialization. To the latter of the two

methods of using the drug, *as an Alternative*, in minute, repeated doses, our attention, then, will be mainly restricted in this consideration of the questioned therapeutic value of mercury.

Recognizing, now, the right and the duty of every professional man, after full knowledge of the facts in any disputed case, to exercise his own judgment in forming an opinion, the writer would briefly give his own conclusions on the point at issue.

And first, from the facts already considered, it would seem reasonable to exclude mercury, whether administered as an *Alternative* or as a *Purgative*, from application to those cases where a decided action upon the liver is desired. With the less hesitation we do this, since, in the *Resina Podophylli* of the U. S. Pharmacopœia, we have an article whose influence upon the liver is beyond question. A word upon the action of this remedy will not be out of place in this connection.

Often, in the experience of the writer, has this remedy been administered to a so-called bilious patient, with a torpid and congested liver, and large quantities of clear bile have been brought away; showing a golden yellow against the white of the containing vessel, as if the contents of the gall bladder had been bodily emptied therein. To cite one case in point, among many others, showing the superiority of this drug. On the evening of April 23d, '65, the writer was summoned to a gentleman, well known in our State, to relieve some presumed disease of the kidney or bladder. Found a well marked case of jaundice; skin deep yellow; the urine excessively irritating, from the amount of bile passing through the kidney. Three nights before, by a domestic prescription, he had taken 12 grs. of calomel, which had produced its usual cathartic action, but with only an aggravation of the symptoms. One dose of the *Podophyllin*, (2 grs.,) brought away an immense amount of bile, clearing up the complexion, the urine, and the case itself. Complaint is made of the uncertainty of this remedy. A knowledge of the fact that the resinoid is not, of itself a cathartic, will relieve it of unjust imputation on that score. It acts as such only through the amount of bile, (the natural alvine stimulus,) which it may be able to empty out into the bowels, and a cathartic action follows or not, according to the varying condition of the liver in the same individual at different times;—while the tendency to gripe will be in a great degree remedied by the oleo-resin of *Ginger* or the *Tincture* of the same, evaporated sufficient to pill. From his personal experience and practice, the writer can hardly recommend the *Podophyllin* too highly to his professional brethren.

But what shall be said of the application of mercury to the treatment of disease in general? The unskilled beginner in medical practice, where among his *armamentaria* shall he locate this common remedy? Shall it be ever in hand, ready for daily, constant use, or shall he hold it in reserve for special occasions?

Consciously or not, every physician, we believe, adopts as his rule the valued maxim, "*Tuto, cito, jucunde curare*,"—to heal safely, quickly, pleasantly. First, 'safely;'—and well it would be if this were always first with every practitioner,—if he would resolve, that at all events he will do no harm, if he do no good; for, in medicine not less than surgery, we handle edge tools. With this maxim before us, and looking at the immense amount of evil that all acknowledge may follow "the injudicious use of mercurials," we inquire, first of all, is mercury a safe remedy?

Turning to Taylor on Poisons, we are surprised to learn that, "Calomel, although commonly regarded as a mild substance, is capable of destroying life, even in comparatively small doses." Cases are given. Two-thirds of a grain, administered for 3 days (2 grs. in all) to a boy 8 years old, "produced most violent salivation, sloughing, and exfoliation, from which he was some weeks in recovering." A little girl of 5 years, for 3 days daily, took 3 grs. of Hydr. c. Cretâ;—sloughing of the mouth, and death in 8 days followed. A girl of 19 years took 3 grs. of blue pill, twice a day for 3 days, (18 grs. in all;) salivation and death in 12 days. A boy of 14, taking at one dose 6 grs. of calomel, died in three weeks from inflammation of the mouth, and gangrene. "Pereira mentions the case of a lady killed by one dose of 20 grs. of calomel; had previously taken a moderate dose without sufficient effect." A girl, aged 11 years, took, in 24 hours, 8 grs. of calomel for an attack of Tracheitis; died in 8 days from inflammation of the mouth and fauces." Other cases still, are reported in Taylor's work; how many hundreds are there, who have found no reporter,—how many of disastrous results following full doses, which the physician was unwilling, even to himself, to acknowledge to have been the effect of the drug? Yet enough are known to make any conscientious physician feel that mercury is far from being a safe remedy. In cases of extreme effect from small doses, it will no doubt be said, "Ah, that is the result of a peculiar idiosyncrasy;" but who is to know when and where he is to run upon one of these peculiar idiosyncrasies, until he shall have made the unfortunate experiment which fills him with consternation. And when once the peculiar effect of mercury has been induced, is there not often developed a peculiar sus-

ceptibility to the drug, that may astonish the careful prescriber, on his next essay, by results out of all proportion to the amount of the remedy! No, we cannot call mercury a *safe* remedy; it is a poison, more or less of whose poisonous influence will be developed, if it be used continuously; and yet its peculiar, alterative action on the system is to be attained only by this continuous use. And it must not be forgotten, that the injurious effect of any poisonous medicine is more protracted and uncertain, if it be a metal, than if it be of vegetable origin, since the metal is a primary element of matter, and therefore capable, if once fairly lodged in the system, of preserving its independent existence indefinitely. Vegetable forms, on the other hand, are unstable, being compounded of the same primitive elements as animal substances; and hence, after exerting their peculiar action become disintegrated, and lost in the general mass.

We feel, then, that for its constitutional effects, mercury can be properly used, if at all, only in extreme cases, where, choosing the lesser of two evils, we esteem the threatened danger of the remedy less than the actual evil pressing upon the patient, and where also no other safer remedy can be found as a substitute.

But, perhaps it will be more satisfactory briefly to consider the therapeutic value of mercury in the treatment of those special diseases where once it had been thought a "*sine quâ non*." *Pneumonia*, with its visions of the lancet and wet cups, the bleedings, "*coup sur coup*," tartar emetic, starvation diet, and colomel "*pro re natâ*"—how changed its treatment! Since experiments in various hospitals many years ago, in some of which the writer was a witness and participant, where the milder cases of this disease were treated with invariable success, with no internal medicine, the antiphlogistic effect of mercurials can no longer be deemed indispensable. Of the two, we prefer a stimulus to the mercurial. Hear Dr. Bennett, (2d Am. Ed., page 636,)—"In this decided case of *Pneumonia*, with absence of chlorides from the urine, we had an opportunity of observing the effect of mercurial salivation on the progress of the disease. Contrasted with other cases, the disease was in no way shortened. The unpleasant effects produced by the mercury were not only so many increased evils, • • • but the cause of prolonging the convalescence." "He could not eat until the 26th day, in consequence of a coppery taste in the mouth. But as soon as nutrients could be taken, he recovered rapidly. No fact could better demonstrate the utter uselessness of the drug, and its occasional mischievous effects."

In inflammation of the various *serous* surfaces, the efficacy of

mercury has been generally thought to be beyond controversy. So judicious a writer as Dr. Graves, treating of Pericarditis, observes:—"how unavailing will be our best directed efforts, unless they be succeeded by speedy mercurialization of the system." Dr. Fuller hesitates not to say, "that no case of pericarditis, occurring in a strong and healthy person, can be safely treated without mercury." It would appear that they, in common with many others, thought such an established fact; but is it, in truth, fact, or theory only?

Hear testimony on the other side. That eminent authority, Dr. Walshe, declares, in reference to this disease, "it must be conceded that any precise evidence before the profession fails to demonstrate the alleged prowess of the mercurial."

Dr. Robert Bentley Todd, in his Clinical Lectures, while upon the subject of rheumatism, expresses the opinion:—"Mercury does not in the least guard the patient against what may be termed the accidents of his malady, those severe internal inflammations, pericarditis, endocarditis, pneumonia, pleuritis, peritonitis. I have more than once seen pericardial inflammation supervene, while the patient was in a state of salivation." A case in point is referred to among those he is lecturing upon.

Dr. T. R. Chambers, in the recently published volume of his Lectures, states a case occurring ten years since, where he put a rheumatic patient, "a fair, young girl of 16," under the influence of mercury, with the purpose of warding off inflammation of the serous sacs. Pericarditis, in its most virulent form, came on, and patient died in the height of it. He does not give mercury now in pericarditis.

Dr. Bennett tells us, (page 531, op. cit.,) "I have now given it [mercury] in many cases, two of which are recorded at length, (Cases LXXXVIII and XCII,) but could never satisfy myself that it had the slightest influence in forwarding or modifying the natural changes which occur. The best evidence on this subject, however, is to be derived from a careful analysis of forty cases of acute rheumatic pericarditis, by the late Dr. John Taylor, in which mercurial ptyalism was produced, with the following results: 1st. Ptyalism was not followed by any abatement of the pericarditis in twelve cases. 2d. In one case ptyalism was followed by speedy relief. 3d. In two cases ptyalism was followed by diminution and then gradual cessation of pericardial murmur. 4th. In one case pericardial murmur had been diminishing for some days before, and it ceased soon after ptyalism was produced. 5th. In one case pericarditis and pneumonia both increased in extent and intensity after ptyalism. 6th. In four cases

pneumonia supervened after the establishment of, and therefore was not prevented by, ptyalism. Was it caused by it? 7th. In three cases, endocarditis supervened after ptyalism. 8th. In six cases ptyalism was followed by pericarditis. 9th. In one case ptyalism could not be produced, and yet the pericarditis went on favorably. 10th. In two cases ptyalism was followed by extensive pleuritis. 11. One case was followed by erysipelas and inflammation of the larynx. In two cases rheumatism continued long after ptyalism was produced. Thus, out of the forty cases, only four can be said to have become better after the mercurial action on the system was established, and in these there can be little doubt that it was purely a matter in coincidence."

Iritis is another form of inflammation in which mercury has been regarded as specific. In his work, before cited, Dr. Bennett gives us the details of a case of double rheumatic iritis, with conjunctivitis of the most severe description, which he resolved to treat without mercury. The case was watched with much interest by the clinical class, and by the ophthalmic surgeon to the Infirmary, who predicted the worst consequences. The Dr. says:—"notwithstanding the weakened condition of the patient, when iritis came on, the severity of the disease in both eyes, and the apparent closure that was about to take place in one pupil, I persevered, and the result in perfect recovery justified my expectations;" and in a period quite short under the circumstances. He adds:—"the case demonstrates that most severe attacks of rheumatic iritis may get well altogether independent of mercurials, and active antiphlogistics; and of 64 cases of iritis, (reported in the Med. and Surg. Journal for 1856,) of every degree of severity, including the idiopathic, traumatic, rheumatic and syphilitic varieties, treated by Dr. H. W. Williams, of Boston, Mass., the results, with four exceptions, which were neglected at the outset, were perfectly good."

Surely, these statements are worthy our serious attention. If the question be whether mercury is *essential* to the cure of these diseases, a single negative case like one of these outweighs a dozen, a hundred, where recovery has followed the mercurial course. And if mercury be not essential, who would not prefer to do without it, and thus avoid all possible risks of damage to the patient's health and comfort, and to the feelings and the reputation of the practitioner?

In *Peritonitis*, we find mercury is recommended, but the writer has witnessed such satisfactory results from the non-mercurial treatment, that he is at a loss to assign any reason for its use in that disease.

In the treatment of *Dysentery*, mercury has been much relied upon

by some. The rationale of its favorable operation in Inflammation of the Large Intestine, it may be difficult to explain upon the pathological views we have heretofore advanced, yet if a reliable experience sustains the belief in its curative powers, we are bound to accept it. But a most reliable observer, Dr. Austin Flint, tells us, (in his recent work on Practice, page 315,)—"The pathological view [of those advocating mercury] is purely conjectural, and clinical observation fails to furnish evidence of any special curative influence to be derived from mercury. The recovery, when treated with mercury, is, of course, no proof of its value in any disease which, like sporadic dysentery, tends intrinsically to recovery."

It is a matter of no little surprise to find that some authors recommend mercurials in *Typhoid Fever*; and such practice is followed by many physicians of this State.

Dr. Stillé, in commending mercurials, makes this strange statement; that "the advantages of purgative treatment in this disease appear now to be well established."(!) Purgation, anything tending to aggravate the already existing inflammation of Peyer's glands, is to be dreaded by the careful physician, increasing, as it does, the intensity of the disease, and at the same time draining off the strength necessary to carry the patient safely through. Why ever, in Typhoid Fever, mercury should be administered, unless the loaded state of the bowels at the outset of the disease demands a cathartic, is a thing utterly incomprehensible. The great effort of the rational physician is, to sustain the patient's strength, until he shall have reached the appointed limit of the disease, (usually three weeks,) when recovery ensues, as a matter of course. But the specific action of mercury, increasing the already too rapid waste of the tissues, reduces the depressed vital force. And besides this, there is a particular inappropriateness in the use of mercury, whose special action, as a local irritant to the colon, and the neighboring part of the ileum, tends still further to irritate the glands of Peyer in that vicinity.

But one stronghold remains, in which this once vaunted remedy may entrench itself. In the treatment of *Syphilis*, mercury has on its side the tradition of centuries. And yet it is not safe from attack even here; tradition, however venerable, is not always reliable. In certain forms of the disease, it would seem that mercury must have accomplished some good; and yet it is a question, whether the evils of its use have not far, far outweighed its benefits. Not till within a very few years past, has the distinction between the two varieties of venereal sore,—between the most contagious, but non-infecting sore,

and that which is the true initial lesion of syphilis, been recognized ; —the essential difference that exists between the “chancroid” and the “chancre.” In the former, the use of mercury is attended with the same evil effects upon the patient’s constitution, and upon the healing of the sore, that would follow the similar treatment of any simple sore ; and with this additional evil, that the physician, overlooking the fact that the absence of constitutional symptoms is due to the nature of the case, and not to his treatment, is still more resolved to put the system of the next similar patient he meets with, under the influence of mercury. Of true syphilis, Dr Bumstead “confidently” states, that “no course of mercury, however thorough and prolonged, administered for a chancre, is likely to prevent the subsequent evolution of general manifestations.” The Dr. believes that the primary chancre will heal more readily under the influence of mercury, but objects to its use, in that it retards, and therefore prolongs, the working off of the constitutional effects. But is it not more reasonable to believe that this retarding is not through any anti-syphilitic power of the drug, but is owing to its physiological action in depressing those vital functions to which alone we can look for the elimination of the poison ?

In this connection observe a very interesting case, introduced by Dr. Bennett, in this year’s edition of his Lectures. The skeleton of a dog, preserved in an Edinburgh museum, is noticeable as presenting the identical disease of the shaft of the long bones, which is recognized as an effect of syphilis ; but to the dog, we are told, syphilis is not communicable. The history of the dog shows that he was poisoned by the gradual introduction of mercury into his system, from the lapping of vermilion oil paint in the shop where he was kept. Does not such an instance as this lead us strongly to suspect that many symptoms, attributed to syphilis, may have been produced by its dangerous remedy ? Are we not strengthened in this suspicion by finding that these syphilitic diseases of bone—as all syphilographers acknowledge—“yield with readiness to *iodine*, with difficulty to *mercury*” ? And especially, when we remember the power of iodide of potassium, (in which form iodine is universally administered,) to eliminate mercury from the system. With such proofs as these, it is not strange that many accurate observers are inclined to believe, that the use of mercury has added incalculably to the horrors and evils of this most horrible of diseases.

The use of mercurials, then, is only to be thought of in the second-

ary forms of syphilis, and only then, if relief can be found in no other way.

The *local action* of mercury, especially of the mild chloride, upon ulcers, whether syphilitic or simple, is undoubtedly of great service, and is attended with little or no likelihood of absorption, and consequent constitutional symptoms.

One word upon the appropriateness of mercury in *membranous croup*. Whatever influence the drug may possess of repressing fibrinous exudation, by altering the constitution of the blood, is too slowly exerted to be of much avail in such a case ; and, it will be seen, must be at the expense of rapidly depressing the system, at a time when all its energies are essential to the continued existence of the half suffocated patient. In diptheritic croup, no rational physician, surely, would advocate mercury.

In Pneumonia, then, in fibrous and serous inflammations, in Iritis, in Dysentery, in Typhoid Fever, we find that, by no means, is mercury essential, as was once thought, to a successful treatment. To what conclusions, then, are we brought ?

When is mercury to be employed ?

In general, we may say,—As an Alterative, *never, if any other efficient and more safe remedy can be found*. As an Alterative for children, it may be employed in diseases of the lower portion of the alimentary canal, with much profit, and with comparative impunity, since, as we have learned, the greater activity of their secreting organs insures them against constitutional infection. If, in such cases, irritability of the stomach coexist, a mercurial preparation may prove the only remedy that can be tolerated. For certain of the constitutional effects of syphilis, we may questionably resort to it. As a Cathartic, if not often repeated, it can be recommended, especially when torpor of the colon is presumed, excepting in cases of idiosyncrasy, or where the system has once been saturated with the drug. As a Local application, to ulcers, whether syphilitic or not, and also to destroy parasites, it has its value. Such are the uses to which the writer would restrict this once universal remedy. In regard to its use in all other respects, it is his firm conviction that, to requote the language of Dr. Walshe on the treatment of Pericarditis, “*any precise evidence before the profession fails to demonstrate the alleged prowess of the mercurial.*”

Of the correctness of these conclusions each professional man will judge for himself, from the facts already given.

It will hardly be necessary, at this point, to inquire into the suc-

cess of a practice conducted on such principles. The facts and the authorities, already quoted, will answer that question. For himself, the writer may be permitted to say, that, during ten years past, he has very seldom given even two consecutive doses of a mercurial to an adult; and the results of his practice, so far, certainly have not been such as to cause him to change his views. Such views, he is well aware, are not yet accepted by the majority of the profession,—nor are they taught in many of our text books, and yet, as he believes, in private practice they are more generally adopted than many are aware, and are daily gaining ground.

The necessarily brief and imperfect manner, in which so extensive a subject must be presented in an essay of this kind, renders it difficult to do full justice to the subject. Yet, what has been written will not be in vain, if but one honest inquirer after truth is assisted to a clearer insight into a question, so important, and yet confessedly involved in so much obscurity, as that of "the real value of the therapeutic effects attributed to mercury."